

The opinion in support of the decision being entered today was **not** written for publication and  
is **not** binding precedent of the Board.

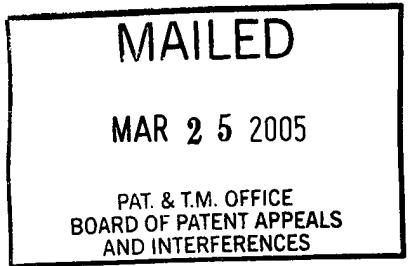
UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

*Ex parte* THOMAS HUTTNER, HELMUT WURZER,  
and REINHARD MAHNKOPF

Appeal No. 2005-0518  
Application No. 09/313,424

HEARD: March 9, 2005



Before OWENS, KRATZ, and TIMM, *Administrative Patent Judges*.

TIMM, *Administrative Patent Judge*.

***DECISION ON APPEAL***

Claims 1-6 and 16-25 are pending in the Application. Claims 1-6 have been withdrawn from consideration. Claims 7-15 have been cancelled. Claim 22 has been deemed allowable if written in independent form. Claims 16-21 and 23-25 stand rejected and are subject to this appeal (Brief, p. 2). We have jurisdiction over the appeal pursuant to 35 U.S.C. § 134.

## ***INTRODUCTION***

The only remaining rejection is a rejection maintained under 35 U.S.C. § 103(a).<sup>1</sup> As evidence of obviousness, the Examiner relies upon the following two prior art references:

Hsu	5,468,657	Nov. 21, 1995
Sato et al.	6,121,117	Sep. 19, 2000
		(filed July 20, 1998)

The specific rejection is as follows: Claims 16-21 and 23-25 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Hsu in view of Sato. (Answer, pp. 3-6).

Claim 16, the only independent claim, is illustrative of the invention on appeal:

16. A method of fabricating a semiconductor configuration, which comprises the following steps:

fabricating a semiconductor structure having a base layer, an insulation layer, a monocrystalline silicon layer, and an interface between the insulation layer and the monocrystalline silicon layer;

placing a passivating substance X into the monocrystalline silicon layer, during or after the fabrication of the semiconductor structure; and

heat-treating the semiconductor structure with the passivating substance X for causing the passivating substance X in the monocrystalline silicon layer to diffuse both to the interface and to a surface of the monocrystalline silicon layer opposite to the interface.

For the reasons presented in the Brief, particularly the reasons presented on pages 14 and 15, we reverse. We add the following primarily for emphasis.

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<sup>1</sup>A rejection of claim 18 under 35 U.S.C. § 112, ¶ 2 has been withdrawn by the Examiner (Advisory Action mailed November 18, 2003).

***OPINION***

Claim 16 requires a step of placing a passivating substance X into the monocrystalline silicon layer of a semiconductor structure additionally having a base layer and an insulation layer. The placement can be done, according to the specification, by ion-implanting a substance such as nitrogen into the layer (specification, p.13, ll. 10-12). The claim also requires a step of heat treating for causing the passivating substance X placed into the monocrystalline silicon layer to diffuse not only to the interface between the monocrystalline silicon layer and the insulation layer, but also to the surface of the monocrystalline silicon layer opposite to the interface. In other words, the passivating substance X must diffuse towards both the upper and lower surfaces of the monocrystalline silicon layer.

The Examiner relies upon Hsu as describing a nitrogen ion implantation step meeting or rendering obvious the step of placing a passivating substance X into the monocrystalline layer. Hsu, however, describes implanting nitrogen ions into the insulating layer (middle layer 59 as shown in Fig. 4), not in the monocrystalline silicon layer 42. Even if some of the ions were to come to rest in the monocrystalline layer, it appears that they would come to rest very near the interface with the insulation layer (Hsu, Fig. 2). The Examiner does not provide any reasonable basis to believe that those ions traverse the entire thickness of the monocrystalline silicon layer 42 to reach the top surface during the heat treatment step in accordance with the diffusion requirement of claim 16. Sato is not relied upon in a manner which cures this deficiency in the rejection.

Not only is there no adequate finding with regard to the diffusion requirement of the claim, the burden shift called for by the Examiner is also not adequately supported. The Examiner indicates that the depth of ion implantation in the process of Hsu “is a function Gaussian distribution [sic] which is dependent on implant energy, ion density, and anneal temperature” and then attempts to shift the burden to Appellants to show that Hsu does not teach the placing step (Answer, pp. 7-8). In a case where it is reasonable to believe that a property relied upon for patentability is inherently present in the prior art, it is reasonable to shift the burden to Appellants to show, in fact, that property does not reside in the prior art. *In re Best*, 562 F.2d 1252, 1255, 195 USPQ 430, 432-33 (CCPA 1977). Such a finding of inherency is not reasonable here because evidence of the Gaussian distribution is present in Hsu itself. Hsu describes the Gaussian distribution of the ions in the process as shown in Figure 2 and explains that “[t]he nitrogen ions come to rest in an [sic] Gaussian distribution pattern *within* the buffed silicon dioxide layer 59.” (Hsu, col. 7, ll. 29-33 (emphasis added)). Hsu specifically states that the ions reside in the silicon dioxide layer 59 (col. 7, ll. 29-33). It is inappropriate under the circumstances of this case to shift the burden to Appellants. While it is *possible* that a small number of ions might come to rest outside the silicon dioxide layer 59, such as in the portion of layer 42 closest to the silicon dioxide layer, inherency cannot be based on probabilities and possibilities, it must be necessarily present. *Akamai Technologies Inc. v. Cable & Wireless Internet Services Inc.*, 344 F.3d 1186, 1192, 68 USPQ2d 1186, 1190 (Fed. Cir. 2003); *In re Oelrich*, 666 F.2d 578, 581, 212 USPQ 323, 326 (CCPA 1981).

We also note that there is no reason, suggestion, or motivation in the prior art to place the nitrogen ions of Hsu into the monocrystalline layer. Hsu specifically desires to place all the ions in the silicon dioxide layer and no teaching in Sato or elsewhere has been relied upon which provides a reason, suggestion, or motivation to modify the location of the nitrogen ion placement.

We conclude that the Examiner has failed to establish a *prima facie* case of obviousness with respect to the subject matter of claims 16-21 and 23-25.

#### ***CONCLUSION***

To summarize, the decision of the Examiner to reject claims 16-21 and 23-25 under 35 U.S.C. § 103(a) is reversed.

REVERSED

*Terry J. Owens*

TERRY J. OWENS  
Administrative Patent Judge

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*Peter F. Kratz*

PETER F. KRATZ  
Administrative Patent Judge

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*Catherine Timm*

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